

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

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in its capacity as elected Office

Date of mailing (day/month/year) 03 March 1999 (03.03.99)	
International application No. PCT/US98/13992	Applicant's or agent's file reference BB1095A
International filing date (day/month/year) 07 July 1998 (07.07.98)	Priority date (day/month/year) 11 July 1997 (11.07.97)
Applicant ODELL, Joan, Tellefsen et al	

1. The designated Office is hereby notified of its election made:

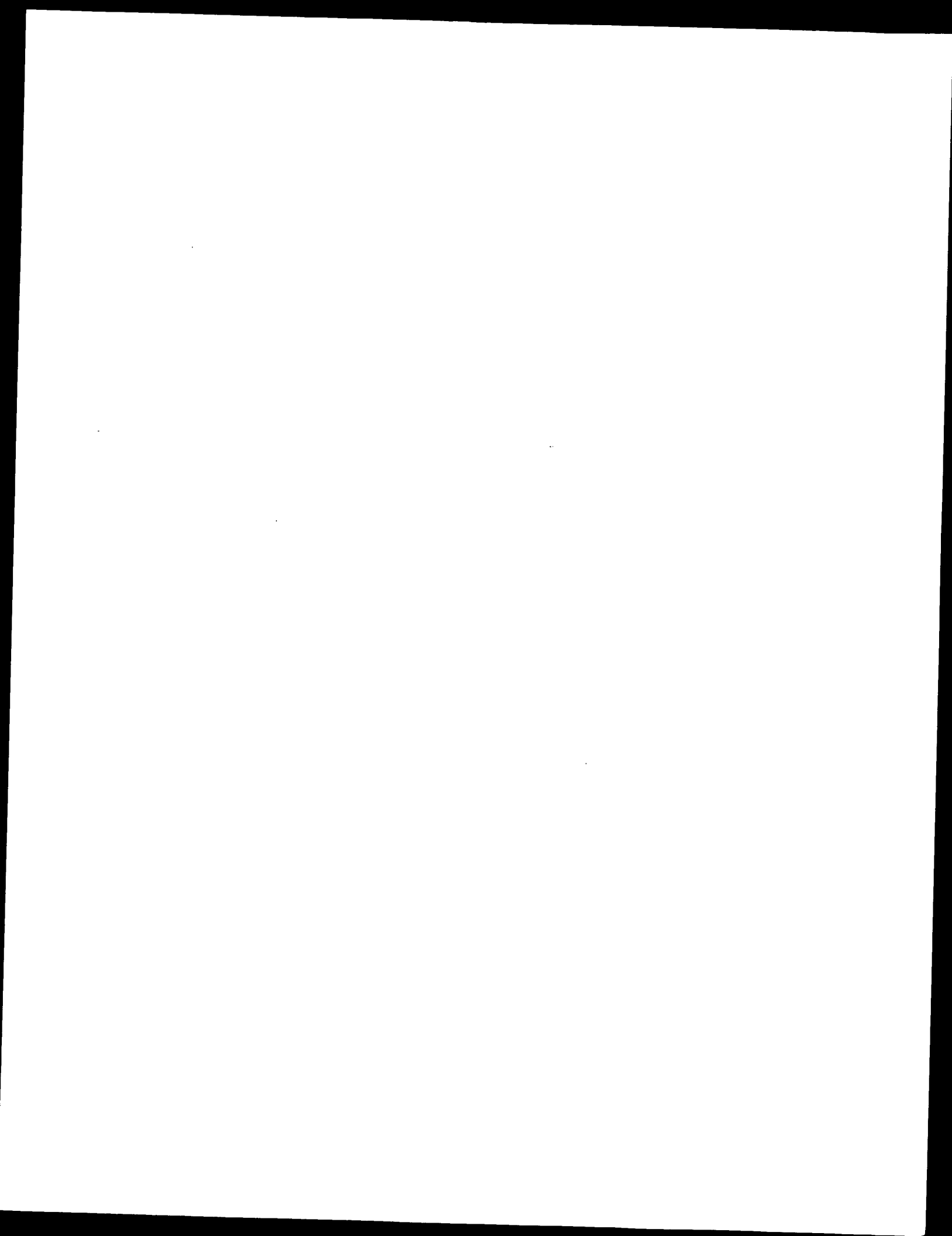
☒ in the demand filed with the International Preliminary Examining Authority on:

25 January 1999 (25.01.99)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer P. Regis Telephone No.: (41-22) 338.83.38
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(71) Applicant (for all designated States except US): E.I. DU PONT DE NEMOURS AND COMPANY [US/US]; 1007 Market Street, Wilmington, DE 19898 (US).		Published With international search report.	
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(54) Title: PLANT SUG1 HOMOLOGS			
(57) Abstract			
<p>This invention relates to an isolated nucleic acid fragment encoding a plant SUG1 protein, a homolog of the mouse SUG1 protein. The invention also relates to the construction of a chimeric gene encoding all or a portion of the plant SUG1 protein, in sense or antisense orientation, wherein expression of the chimeric gene results in production of altered levels of the plant SUG1 protein in a transformed host cell.</p>			
1	MATVAMDISKPTPAASGDEAAAAAKGRSGGGGEGLRQYYLQHIHDLQLQIRKTHNLNRL	1	EAQRNDLNSRVMLREELQLLQEPGSYVGEVVKVMGSKVLVVKVHPGKGVVDIDKSIDI
2	MALVGVVELKHAAGVPEANCSA...KPTKQGEGLRHYSLNIHEHQLLRKQTHNLNRL	2	EAQRNDLNSRVMLREELQLLQEPGSYVGEVVKVMGSKVLVVKVHPGKGVVDIDKSIDI
3	MALDGFPEQMELEEG.....KAGSGLRQYYLSKIEELQLIYVNDKSSQNLRL	3	EAQRNDLNSRVMLREELQLLQEPGSYVGEVVKVMGSKVLVVKVHPGKGVVDIDKSIDI
4	MATVAMDISKPTPAASGDEAAAAAKGRSGGGGEGLRQYYLQHIHDLQLQIRKTHNLNRL	4	EAQRNDLNSRVMLREELQLLQEPGSYVGEVVKVMGSKVLVVKVHPGKGVVDIDKSIDI
1	TKITPSTRVALRNDSYMLHLILPSKVDPLVNLMMKVEKVPDSTYDMIGGLDQIQEIKEVI	1	ELPIKHPFELFESLGIAQPKGVLLYGPPGTGKTLARAVAHHTDCTFIRVSGSELVQKYIG
2	TKITPSTRVALRNDSYMLHLILPSKVDPLVNLMMKVEKVPDSTYDMIGGLDQIQEIKEVI	2	ELPIKHPFELFESLGIAQPKGVLLYGPPGTGKTLARAVAHHTDCTFIRVSGSELVQKYIG
3	NDVTPNCRVALRNDSYMLHLILPSKVDPLVNLMMKVEKVPDSTYDMIGGLDQIQEIKEVI	3	ELPVKHPFELFESLGIAQPKGVLLYGPPGTGKTLARAVAHHTDCTFIRVSGSELVQKYIG
4	.....	4	.....
1	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE	1	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE
2	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE	2	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE
3	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE	3	EGSRMVELFVMAREHAPSIIFMDEIDSIGSARMESGTGNGDSEVQRTMLELLNQLDGFE
4	.....	4	.....
1	ASNKIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL	1	ASNKIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL
2	ASNKIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL	2	ASNKIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL
3	ATKNIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL	3	ATKNIKVLMATNRIDILDQALLRPGRIDRKIEFTPNNEESRLDILKHSRQNLNLRGIDL
4	.....	4	.....
1	KKIAEKMGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL	1	KKIAEKMGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL
2	KKIAEKMGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL	2	KKIAEKMGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL
3	KKIAELMPGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL	3	KKIAELMPGASGAELKAVCTEAGMFALRERRVHVTVQEDFEMAVAKVMKDEKNNMSLRKL
4	.....	4	.....
1	WK	1	WK
2	WK	2	WK
3	WK	3	WK
4	..	4	..



# PATENT COOPERATION TREATY

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**WILLIAM R. MAJARIAN**

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NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

Date of mailing  
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20.07.99

Applicant's or agent's file reference  
BB1095A

**IMPORTANT NOTIFICATION**

International application No.  
PCT/US98/13992

International filing date (day/month/year)  
07/07/1998

Priority date (day/month/year)  
11/07/1997

Applicant

E.I. DU PONT DE NEMOURS AND COMPANY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

**4. REMINDER**

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Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

**TRB NOTED**

1.27.99

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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>BB1095A</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/US98/13992</b>	International filing date (day/month/year) <b>07/07/1998</b>	Priority date (day/month/year) <b>11/07/1997</b>	
International Patent Classification (IPC) or national classification and IPC <b>C12N15/29</b>			
Applicant <b>E.I. DU PONT DE NEMOURS AND COMPANY et al.</b>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li> </ul>			
Date of submission of the demand <b>25/01/1999</b>		Date of completion of this report <b>2 0. 07. 99</b>	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465		Authorized officer  <b>Bretherick, J</b>  Telephone No. (+49-89) 2399	





**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/US98/13992

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

**Description, pages:**

1-41 as originally filed

**Claims, No.:**

1-10 as originally filed

**Drawings, sheets:**

1/3-3/3 as originally filed

**2. The amendments have resulted in the cancellation of:**

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

**4. Additional observations, if necessary:**



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/US98/13992

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 2, 10
	No: Claims 1, 3-9
Inventive step (IS)	Yes: Claims 2, 10
	No: Claims 1, 3-9
Industrial applicability (IA)	Yes: Claims 1-10
	No: Claims

**2. Citations and explanations**

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/US98/13992

Regarding Part VIII Art. 5 and 6 PCT and Part V Art. 33 PCT:

1. This opinion has been written on the assumption that the entire claimed subject-matter enjoys the priority right assigned to US application 08/893,401, filed 11/07/97. Were this not the case, then the disclosure of Covitz et al. (1997) EMBL SEQUENCE ACCESSION NO. AA660628 and Perry et al. (1998) EMBL SEQUENCE ACCESSION NO. AF051251 might become relevant art under Art. 33 PCT.
2. Regarding Part VIII and VII: the subject-matter of claim 1 is defined as being an isolated nucleic acid fragment encoding a plant SUG1 protein comprising a member selected from the group consisting of:
  - a). an isolated nucleic acid fragment encoding all or a **substantial portion** of the amino acid sequence of either SEQ. ID. NOs: 2, 4, 6, 12 or 14;
  - b). an isolated nucleic acid fragment that is **substantially similar** to the isolated nucleic acid of a).;
  - c). an isolated nucleic acid fragment that is complementary to a). or b).

The definition of what is either **substantially similar** or what is a **substantial portion** of the above sequences is left open to interpretation, since this is not defined in the claims **per se**. This leads to a lack of clarity under Art. 6 PCT, with respect to claims 1-9.

Moreover, there are no known structural features which might enable a skilled person to identify a plant SUG1 protein over for example one from yeast or an animal. Claim 10 is for this reason alone not clear in scope.

The current position with regards Art. 5 PCT is that there is no disclosure in the current application or elsewhere of instances where the activity of plant SUG1 protein has been measured, nor what might be expected to result when this activity is inhibited (cf. Example 7, last paragraph). Therefore the skilled person would not be in a position to be able to carry out the subject-matter of claim 10





**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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without exercising inventive skill and/or instigating a research program, of which claim 10 is merely a proposition. The subject-matter of claim 10 is therefore considered to be deficient under Art. 5 PCT.

3. Regarding Part V, Art. 33 PCT as a consequence of the above, Vom Baur et al. (1996) the EMBL Journal Vol. 15, pp. 110-124 and EMBL SEQUENCE ACCESSION NO. Z54219 disclose a nucleotide sequence encoding the mouse SUG1 gene. This is considered to fall under the scope of claim 1.

A construct of a mouse SUG1 encoding sequence fused to a *lexA* -RARalpha (DEF) fusion protein has been constructed. This has been used in assay systems in yeast (see *inter alia*, LH column of p.111). The subject-matter of claims 1, 3-5, 8 and 9 are not novel under Art. 33(1)(2) PCT.

The latter two claims are not novel, since these are product-by-process claims defined by methods of manufacture which are so broad that their products *per se* are anticipated by this disclosure. Note that even if a process for the manufacture of a product is novel and inventive *per se*, this does not automatically convey novelty/inventive step on the product thereby produced.

A similar position applies with respect to Prombona et al. (1995), Plant Molecular Biology, Vol. 27, pp. 1109-1118, (EMBL SEQUENCE ACCESSION NO: x74426) who describe a tomato sequence having a putative structure of  $Mg^{2+}$  - dependent ATPases.

Akiyama et al. (1995) FEBS Letters Vol. 363 pp. 151-156, disclose the cloning by hybridisation of ATPase subunit p45 of human 26S proteasome which is a yeast SUG1 transcriptional factor homolog. The nucleotide product falls under the scope of claim 1, based upon the open interpretation discussed above. The methods of claims 6 and 7 are essentially followed by this disclosure. The end result, namely the amino acid sequence derived enables the skilled person to synthesise at least an undefined portion of the sequences as defined in claim 1, thus anticipating also the subject-matter of claims 8 and 9 (Fig. 1, page 153, part 3, results and discussion, bridging pages 151 and 152).



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/US98/13992

4. Notwithstanding the above **caveat** the subject-matter of claims 2 and 10 is novel and in view of the paucity of information available in the art with respect to sequences of this type and SUG1 function, considered to involve an inventive step under Art. 33(1)(2)(3) PCT.



Title

Flexible Polar Thermoplastic  
Polyolefin Compositions

Background of the InventionField of Invention:

This invention relates to polyolefin compositions and more particularly to such compositions which are flexible and polar, and to shaped articles made from them.

Background Discussion:

Polyvinyl chloride (PVC) sheets have been on the market for many years and have been the standard liner material in the housing industry. PVC sheets are characterized by being flexible over a variable temperature range, heat-sealable, and oil-resistant. However, with the trend toward a chlorine-free environment, there is a need for a PVC sheeting alternative. Ethylene/propylene/diene monomer (EPDM) rubbers are alternatives, but these are difficult to seal. Thus, there is a need for PVC-free sheets which are thermoplastic and heat-sealable, halogen-free and flexible.

Summary of the Invention

According to the present invention there is provided a flexible, non-halogen-containing polymer composition which comprises a blend of:

(a) 35-96% by weight of a non-polar thermoplastic polyolefin;

(b) 3-50% by weight of a polar ethylene copolymer which comprises:

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(i) 30-80% by weight of ethylene;

(ii) 5-60% by weight of at least one copolymerizable, ethylenically unsaturated organic compound; and

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(iii) 3-30% by weight of carbon monoxide; and

(c) 1-30% by weight of a compatibilizing agent which is a carboxylic acid or derivative thereof grafted olefin polymer.

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#### Detailed Description of the Invention

20 The invention relates to flexible, non-halogen containing thermoplastic polymer blends which are useful in sheet form as liners for roofing, etc. or for making folders, and in film form as packaging films. These blends generally are formed by combining a non-polar thermoplastic polyolefin and a soft, polar thermoplastic ethylene copolymer. A compatibilizing agent is  
25 required in order to affect the blend. Such polymer blends can be formed into sheets, films, and other shaped articles which have many properties comparable to polyvinyl chloride (PVC), but with better elongation and with no chlorine.

30 The term "non-polar thermoplastic polyolefin" means any polyolefin polymer which is thermoplastic but which excludes polar ethylene copolymers as defined herein. In general, these polyolefins will have a melt flow index (MFI) in the range of 0.01-100 g/10 min., preferably less than 5 g/10 min. as determined by  
35 ASTM D-1238 (measured at 2,16 kg and 190°C or 230°C depending on the polyolefin used). Useful polyolefins are high density polyethylene (HDPE) and polypropylene. Other polyolefin

homopolymers and copolymers of ethylene can be utilized in the practice of this invention. Such other polyolefins include low density polyethylene (LDPE), very low density polyethylene (VLPE), linear low density polyethylene (LLDPE) and polybutylene (PB). However, these other polyolefins can be blended with other polyolefins such as polypropylene ("PP") or high density polyethylene ("HDPE"). As used herein the term "polypropylene" includes homopolymers of propylene as well as copolymers of polypropylene which can contain about 1 to about 20 weight percent ethylene or an alpha olefin comonomer of 4 to 16 carbon atoms. The polypropylene can be highly crystalline isotactic or syndiotactic polypropylene. The copolymer can be either a random or block copolymer. The density of the PP or copolymer can be from about 0.88 to about 0.92 g/cc; generally, from about 0.89 to about 0.91 g/cc.

High density polyethylene useful as a polyolefin resin of this invention, has a density of about 0.941 to about 0.965 g/cc. High density polyethylene is an established product of commerce and its manufacture and general properties are well known to the art. Typically, HDPE has a relatively broad molecular weight distribution, characterized by the ratio of weight average molecular weight to number average molecular weight of from about 20 to about 40.

Low density polyethylene (LDPE) as used herein means both low and medium density polyethylene having densities of about 0.910 to about 0.940 g/cc. The terms include linear polyethylene as well as copolymers of ethylene which are thermoplastic resins, but non-polar.

Very low density polyethylene (VLDPE) is used herein to mean polyethylene having a density below about 0.910 g/cc and includes linear polyethylene as well as copolymers of ethylene which are thermoplastic resins, but non-polar.

Linear low density polyethylene (LLDPE) is a class of low density polyethylene characterized by little, if any, long chain branching, in contrast to conventional LDPE. The processes for producing LLDPE are well known in the art and commercial grades of this polyolefin are available. The term LLDPE means copolymers of ethylene and other alpha-olefins such as 1-butene, 1-hexene, and 1-octene. Useful LLDPEs have both high and low molecular weights. Such copolymers with 1-butene tend to be more crystalline and thus are more useful as roofing liners; whereas such copolymers with 1-octene are clearer and perhaps more useful in packaging applications. The LLDPEs are preferred.

Polybutylene includes both poly (1-butene) homopolymer and a copolymer with, for example, ethylene, propylene, pentene-1, etc. Commercially useful products are of high molecular weight and isotacticity. A variety of commercial grades of both homopolymer and ethylene-butene-1 copolymers are available with melt flow indices that range from about 0.3 to about 20 g/10 min.

The non-polar thermoplastic polyolefins are present in blends of the invention at a concentration in the range of 35-96% by weight, with the concentration used depending upon the final use of the blend. For example, blends useful in a blown film process to make films for packaging applications will, in general, contain more polyolefin (e.g., 50-80%) than blends useful to make sheets for roofing liners (e.g., 40-50%).

Polar ethylene copolymers useful in the blends of this invention and their preparation are described in U.S. Patent 3,780,140 to Hammer, the description of which is incorporated by reference.

These polar ethylene copolymers consist essentially of ethylene, carbon monoxide and one or more termonomers which are chlorine-free and are copolymerizable ethylenically unsaturated organic compounds. Such termonomers are selected from the class consisting of non-chlorine containing unsaturated mono- and dicarboxylic acids of 3-20 carbon atoms, esters of such



unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids wherein the acid group has 1-18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1-18 carbon atoms, acrylonitrile, methacrylonitrile, copolymerizable unsaturated  
5 hydrocarbons such as alpha-olefins of 3-12 carbon atoms, ring compounds such as norbornene and vinyl aromatic compounds.

In particular, these copolymers consist essentially of, by weight, (a) 30-80% ethylene, (b) 3-30% carbon monoxide, and (c) 5-60% of  
10 one or more termonomers copolymerizable therewith to produce solid copolymers. Preferred copolymers include those consisting essentially of 56-76% ethylene, 3-15% carbon monoxide, and 10-34% of said termonomer(s). More preferred copolymers include those in which vinyl acetate or an alkyl (1-8 carbons) acrylate or  
15 alkyl methacrylate (particularly n butyl acrylate) is the termonomer. The copolymers normally have a melt flow index within the range 0.1-1000 g/10 min., preferably 1-500, measured according to ASTM D-1238. Most preferably, the melt index is less than 100 g/10 min.

20 The polar ethylene copolymers are present in blends of the invention at a concentration in the range of 3-50% by weight, with the particular concentration used being dependent upon the final use of the blend. For roofing liners and other industrial sheeting  
25 uses, 20-50% of the copolymer will be used; whereas for packaging films made by a blown film process, 10-40% of copolymer is sufficient to increase polarity.

The blends of the invention also contain 1-30% by weight of a  
30 compatibilizing agent, typically 5-20% by weight. The compatibilizing agent is an olefin polymer which has been functionalized by grafting a carboxylic acid or derivative thereof (such as an anhydride) to the polymer by known processes. Any of the above-described non-polar thermoplastic polyolefins can be  
35 subjected to the grafting process. A polyolefin is graft modified with 0.05 to 3.0 weight percent, preferably 0.5 to 1 weight percent, of a carboxylic acid or a derivative thereof. The grafting

of the polyolefin can be carried out in the melt state, in solution or in suspension as described in the state-of-the-art literature. The melt viscosity of the modified polyolefin is not restricted, however, most effective compatibilization with modified  
5 polypropylene is found if the melt index, measured according to ASTM D-1238 (at 2.16 kg and 190°C) is between 50 to 150 g/10 min. and with modified polyethylene if the melt index (measured at 2.16 kg and 190°C) is less than 6 g/10 min., respectively. Maleic anhydride is the preferred functionalizing agent. Such  
10 modified polyolefins can be prepared as described, for example, in published European Patent Application Nos. 370,735 and 370,736.

The blends of the invention can be prepared by mixing the polymeric ingredients and optional additives by use of  
15 conventional masticating equipment, for example, a rubber mill, Brabender Mixer, Banbury Mixer, Buss-ko kneader, Farrel continuous mixer, or twin screw continuous mixer. Mixing times should be sufficient to obtain homogeneous blends. Satisfactory mixing times depend upon the types of polymers and upon the  
20 type and amount of compatibilizer. Typically, mixing times of about 5 minutes are satisfactory. If the polymer blend is obviously non-homogeneous, additional mixing is required.

In addition to its polymer components, the composition of this  
25 invention can include reinforcing and non-reinforcing fillers, antioxidants, stabilizers, lubricants (e.g., oleamide), antiblocking agents, antistatic agents, waxes, coupling agents for fillers, pigments, fire retardants, titanium dioxide, talc and other processing aids known in the polymer compounding art. These  
30 pigments and other additives comprise 0 to about 50 weight percent of the total composition preferably 5 to 30 weight percent of a filler.

The invention can be further understood by the following  
35 examples in which parts and percentages are by weight and temperatures are in degrees Celsius.

Description of the Preferred EmbodimentsExample 1

- 5 A polymeric blend was prepared by meltcompounding 100 phr of a linear low density polyethylene copolymer (LLDPE) containing 10% = butene and having a MFI (190°/2.16kg) = 1.0, 100 phr of an ethylene terpolymer (60% ethylene, 30% n-butylacrylate, and 10% carbon monoxide (EnBACO) having a MFI (190°/2.16 kg) = 12  
10 and 10 phr of the above linear low density polyethylene copolymer grafted with 0.085 % maleic anhydride (LLDPE-MA). Melt compounding was carried out in a Brabender internal mixer with batches from 50-55 grams at 180° at a speed of 60 rpm for ca. 5 minutes. The melt then was removed and formed into a  
15 testing plaque in a hydraulic press at 180° for 5 minutes. Afterwards stress-strain testing (DIN 53 504; S2) was carried out. Results are shown in Table 1.

Table 1

20

<u>Example Number</u>	<u>1</u>	<u>Comparison</u>
LLDPE	47.6%	50%
EnBACO	47.6%	50%
LLDPE-MA	4.8%	-
<u>Properties</u>		
TS (MPa)	6.5	5.0
Mod 100 (MPa)	5.0	0
EB (%)	484	70

25

Addition of a maleic anhydride grafted polyolefin to a blend of a polar, elastomeric ethylene copolymer and an unpolar, thermoplastic polyolefin has greater flexibility than the pure elastomer-thermoplastic blend as shown by the better elongation at break.

30

Example 2 and 3

Polymeric blends were prepared by melt compounding the polymers of example 1 with different mineral fillers such as  
5 Mg(OH)<sub>2</sub> and CaCO<sub>3</sub>. Melt compounding was carried out in a  
Brabender internal mixer with batches from 50-55 grams at 180°  
at a speed of 60 rpm for ca. 5 minutes. The melt then was  
removed and formed into a testing plaque in a hydraulic press at  
180° for 5 minutes. Afterwards stress-strain testing (DIN 53  
10 504,S2) was carried out. Results are shown in Table 2.

Table 2

<u>Example Number</u>	<u>2</u>	<u>3</u>
LLDPE	35.3%	35.3%
EnBACO	35.3%	35.3%
LLDPE-MA	7.1%	7.1%
Mg(OH) <sub>2</sub>	17.8%	-
CaCO <sub>3</sub>	-	17.8%
Antioxidant	0.4%	0.4%
TiO <sub>2</sub>	4.0%	4.0%
Stearic acid	0.1%	0.1%
<u>Properties</u>		
TS(MPa)	6.0	6.0
Mod100 (MPa)	5.9	5.5
EB (%)	220	342
Shore A	94	93
Tear (KN/m)	178.4	158.8

15

Addition of fillers has reduced physical properties of polymer blends as described in Example 1, but not to the level of the unfilled comparison.

Examples 4 - 6

Polymeric blends were prepared by melt compounding the LLDPE and LLDPE-MA of Example 1 with 70 phr of various amorphous terpolymers. The first terpolymer was the terpolymer of Example 1. The second terpolymer was 62.5% ethylene, 28.5% vinyl acetate, and 9% carbon monoxide (EVACO 1) having a melt flow (190°/2.16 kg) of 35; and the third terpolymer was 71.5% ethylene, 20.5% vinyl acetate and 8% carbon monoxide (EVACO 2) having a melt flow index (190°/2.16 kg) of 15.

Melt compounding was carried out in a Brabender internal mixer with batches from 50-55 grams at 180° at a speed of 60 rpm for ca. 5 minutes. The melt then was removed and formed into a testing plaque in a hydraulic press at 180° for 5 minutes. Afterwards stress-strain (DIN 53 504,S2) testing was carried out. Results are shown in Table 3.

Table 3

<u>Example No.</u>	<u>4</u>	<u>5</u>	<u>6</u>
LLDPE	47%	47%	47.0%
EnBACO	33%	-	-
EVACO1	-	33%	-
EVACO2	-	-	33%
LLDPE-MA	7.0%	7.0%	7.0%
Antioxidant	0.47%	0.47%	0.47%
TiO <sub>2</sub>	4.6%	4.6%	4.6%
CaCO <sub>3</sub>	7.0%	7.0%	7.0%
Acrylic	0.93%	0.93%	0.93%
Proc.Aid			

Properties:

TS(MPa)	12.2	14	11.6
Mod100 (MPa)	6.1	7.3	6.3
EB (%)	792	704	726

This example shows that different polar ethylene terpolymers can be melt compounded with polyolefins to provide flexible blends.

5

### Examples 7 - 15

Polymeric blends were prepared from the polymers of Example 1 using different concentrations as shown in Table 4. Melt compounding was carried out in a Brabender internal mixer with batches from 50-55 grams at 180° at a speed of 60 rpm for ca. 5 minutes. The melt then is removed and formed into a testing plaque in a hydraulic press at 180° for 5 minutes. Afterwards stress-strain testing was carried out. Results are shown in Table 4.

15

Table 4

<u>Example No.</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>
LLDPE	40	87	56	55.5	65.5	48	71.5	79	71
EnBACO	40	9	40	24.5	24.5	40	24.5	9	9
LLDPE-MA	20	4	4	20	10.0	12	4	12	20
<u>Properties:</u>									
TS (MPa)	10.7	23.1	11.8	18.8	19.2	9.3	18.4	23.4	21.9
Mod100 (MPa)	5.9	8.6	6.0	6.9	7.9	6.2	7	8.5	8.3
EB(%)	704	842	708	838	814	662	805	839	827

20 These examples show the range of concentrations where a polar copolymer can be used in combination with a polyolefin to provide flexible polymer blends.

Examples 16 and 17

Polymer blends were prepared by melt compounding various amounts of the polymers of Example 1. Melt compounding was carried out in a 25 mm. corotating double screw extruder at a rate of 7 kg/hr and at a temperature of 200°. Then the resulting pelletized material was reextruded on a 30 mm single screw extruder (L/D=25/1), equipped with a 3:1 compression ratio continuous compression screw at a temperature of 200° through a cast film die tool. Physical testing (DIN 53504,S2; DIN 53 507) was carried out on the extruded film (1 mm). Results are shown in Table 5.

Table 5

<u>Example No.</u>	<u>16</u>	<u>17</u>	<u>Comparison</u>
LLDPE	54.75	89.5	100
EnBACO	34.15	8.0	-
LLDPE-MA	10.00	2.0	-
Antioxidant	0.50	0.5	-
<u>Properties:</u>			
TS(MPa)	8.3	21.8	27.0
Mod100(MPa)	6.5	7.8	9.3
EB(%)	520	855	845
Tear(kN/m)	58	94	-
Volume Change after 7 days			
in ASTM Oil	23	-	43.3
No.1/100°C(%)			
in ASTM Oil No.3/RT (%)	1.7	-	2.1

These examples show that compatibilized blends of polar and non-polar polyolefins provide flexible films. Also an increase in oil resistance is seen.

What is claimed is:

1. A flexible, non-halogen-containing polymer composition which comprises a blend of:
  - (a) 35-96% by weight of a non-polar thermoplastic polyolefin;
  - (b) 3-50% by weight of a polar ethylene copolymer consisting essentially of:
    - (i) 30-80% by weight of ethylene;
    - (ii) 5-60% by weight of at least one copolymerizable, ethylenically unsaturated organic compound; and
    - (iii) 3-30% by weight of carbon monoxide; and
  - (c) 1-30% by weight of a compatibilizing agent which is a carboxylic acid or derivative thereof grafted olefin polymer.
2. A flexible polymer composition of Claim 1 wherein the non-polar thermoplastic polyolefin is polypropylene, high density polyethylene, or a linear low density polyethylene.
3. A flexible polymer composition of Claim 1 or Claim 2 wherein the polar ethylene copolymer consists essentially of:
  - (i) 56-76% by weight of ethylene;
  - (ii) 10-34% by weight of vinyl acetate or an alkyl acrylate or alkyl methacrylate, wherein the alkyl group is from 1-8 carbon atoms; and
  - (iii) 3-15% by weight of carbon monoxide.



4. A flexible polymer composition according to any of Claims 1-3 wherein the compatibilizing agent is an acid grafted polypropylene or acid grafted polyethylene having an acid content of 0.05 - 3% by weight of the polymer.
- 5
5. A flexible polymer composition according to Claim 4 wherein acid grafted olefin polymer is (a) a maleic acid or anhydride grafted polypropylene having a melt flow index measured at 2.16 kg and 190°C in the range of 50-150 g/10 min., or (b) a
- 10 maleic acid or anhydride grafted polyethylene or a linear low density polyethylene having a melt flow index measured at 2.16 kg and 190°C of less than 5 g/10 min.
6. A flexible polymer composition according to any of Claims 1-5,
- 15 wherein the blend comprises
- (a) 40-50% by weight of non-polar thermoplastic polyolefin;
- 20 (b) 20-50% by weight of polar ethylene copolymer; and
- (c) 10-15% by weight of acid grafted olefin polymer.
7. A flexible polymer composition according to any of Claims 1-5
- 25 wherein the blend comprises
- (a) 50-80% by weight of non-polar thermoplastic polyolefin;
- 30 (b) 10-40% by weight of polar ethylene copolymer; and
- (c) 1-15% by weight of acid grafted olefin polymer.
8. A flexible polymer composition according to any of Claims 1-7
- 35 wherein additives are contained in the composition up to 50 % by weight of the total composition.

9. A flexible polymer composition according to any of Claims 1 -8 wherein a filler is added at a concentration of 5 to 30 % by weight of the filled composition.
- 5 10. A flexible composition according to any of Claims 1-9 in the form of a shaped article.
11. A flexible composition according to Claim 10 wherein the shaped article is a sheet or film.
- 10

## INTERNATIONAL SEARCH REPORT

Internation. application No  
PCT/US 93/07369A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 C08L23/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 5 C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,A,36 33 056 (KABELMETAL ELECTRO) 7 April 1988 Abstract	1
A	WO,A,88 03543 (E.I. DU PONT DE NEMOURS) 19 May 1988 see claim 1	1

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*A\* document member of the same patent family

Date of the actual completion of the international search

23 December 1993

Date of mailing of the international search report

13. 01. 94

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
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Authorized officer

Goovaerts, R

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US 93/07369

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-3633056	07-04-88	NONE	
WO-A-8803543	19-05-88	CA-A- 1318421	25-05-93
		DE-A- 3785846	17-06-93
		EP-A, B 0290588	17-11-88
		JP-T- 1501713	15-06-89
		US-A- 5091478	25-02-92

# PATENT COOPERATION TREATY

## PCT

REC'D 26 JUL 1999

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BB1095A	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US98/13992	International filing date (day/month/year) 07/07/1998	Priority date (day/month/year) 11/07/1997
International Patent Classification (IPC) or national classification and IPC C12N15/29		
Applicant E.I. DU PONT DE NEMOURS AND COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 25/01/1999	Date of completion of this report 2 0. 07. 99
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel: (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Bretherick, J Telephone No. (+49-89) 2399 



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/US98/13992

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-41 as originally filed

**Claims, No.:**

1-10 as originally filed

**Drawings, sheets:**

1/3-3/3 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:





**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/US98/13992

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims 2, 10
	No:	Claims 1, 3-9
Inventive step (IS)	Yes:	Claims 2, 10
	No:	Claims 1, 3-9
Industrial applicability (IA)	Yes:	Claims 1-10
	No:	Claims

**2. Citations and explanations**

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/US98/13992

Regarding Part VIII Art. 5 and 6 PCT and Part V Art. 33 PCT:

1. This opinion has been written on the assumption that the entire claimed subject-matter enjoys the priority right assigned to US application 08/893,401, filed 11/07/97. Were this not the case, then the disclosure of Covitz et al.(1997) EMBL SEQUENCE ACCESSION NO. AA660628 and Perry et al. (1998) EMBL SEQUENCE ACCESSION NO. AF051251 might become relevant art under Art. 33 PCT.
2. Regarding Part VIII and VII: the subject-matter of claim 1 is defined as being an isolated nucleic acid fragment encoding a plant SUG1 protein comprising a member selected from the group consisting of:
  - a). an isolated nucleic acid fragment encoding all or a **substantial portion** of the amino acid sequence of either SEQ. ID. NOs: 2, 4, 6, 12 or 14;
  - b). an isolated nucleic acid fragment that is **substantially similar** to the isolated nucleic acid of a).;
  - c). an isolated nucleic acid fragment that is complementary to a). or b).

The definition of what is either **substantially similar** or what is a **substantial portion** of the above sequences is left open to interpretation, since this is not defined in the claims **per se**. This leads to a lack of clarity under Art. 6 PCT, with respect to claims 1-9.

Moreover, there are no known structural features which might enable a skilled person to identify a plant SUG1 protein over for example one from yeast or an animal. Claim 10 is for this reason alone not clear in scope.

The current position with regards Art. 5 PCT is that there is no disclosure in the current application or elsewhere of instances where the activity of plant SUG1 protein has been measured, nor what might be expected to result when this activity is inhibited (cf. Example 7, last paragraph). Therefore the skilled person would not be in a position to be able to carry out the subject-matter of claim 10



without exercising inventive skill and/or instigating a research program, of which claim 10 is merely a proposition. The subject-matter of claim 10 is therefore considered to be deficient under Art. 5 PCT.

3. Regarding Part V, Art. 33 PCT as a consequence of the above, Vom Baur et al. (1996) the EMBL Journal Vol. 15, pp. 110-124 and EMBL SEQUENCE ACCESSION NO. Z54219 disclose a nucleotide sequence encoding the mouse SUG1 gene. This is considered to fall under the scope of claim 1.

A construct of a mouse SUG1 encoding sequence fused to a *lexA*-RAR $\alpha$  (DEF) fusion protein has been constructed. This has been used in assay systems in yeast (see *inter alia*, LH column of p.111). The subject-matter of claims 1, 3-5, 8 and 9 are not novel under Art. 33(1)(2) PCT.

The latter two claims are not novel, since these are product-by-process claims defined by methods of manufacture which are so broad that their products *per se* are anticipated by this disclosure. Note that even if a process for the manufacture of a product is novel and inventive *per se*, this does not automatically convey novelty/inventive step on the product thereby produced.

A similar position applies with respect to Prombona et al. (1995), Plant Molecular Biology, Vol. 27, pp. 1109-1118, (EMBL SEQUENCE ACCESSION NO: x74426) who describe a tomato sequence having a putative structure of Mg<sup>2+</sup> - dependent ATPases.

Akiyama et al. (1995) FEBS Letters Vol. 363 pp. 151-156, disclose the cloning by hybridisation of ATPase subunit p45 of human 26S proteasome which is a yeast SUG1 transcriptional factor homolog. The nucleotide product falls under the scope of claim 1, based upon the open interpretation discussed above. The methods of claims 6 and 7 are essentially followed by this disclosure. The end result, namely the amino acid sequence derived enables the skilled person to synthesise at least an undefined portion of the sequences as defined in claim 1, thus anticipating also the subject-matter of claims 8 and 9 (Fig. 1, page 153, part 3, results and discussion, bridging pages 151 and 152).



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/US98/13992

4. Notwithstanding the above **caveat** the subject-matter of claims 2 and 10 is novel and in view of the paucity of information available in the art with respect to sequences of this type and SUG1 function, considered to involve an inventive step under Art. 33(1)(2)(3) PCT.





# PATENT COOPERATION TREATY

*Ug. Bawlsch*

From the INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:  
E.I. DU PONT DE NEMOURS AND COMPANY  
Legal/Patent Records Center  
Attn. MAJARIAN, W.  
1007 Market Street  
Wilmington, Delaware 19898  
UNITED STATES OF AMERICA

RECEIVED

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PATENT RECORDS  
CENTER

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing  
(day/month/year)

02/11/1998

Applicant's or agent's file reference

BB1095A

**FOR FURTHER ACTION**

See paragraphs 1 and 4 below

International application No.

PCT/US 98/13992

International filing date  
(day/month/year)

07/07/1998

Applicant

E.I. DU PONT DE NEMOURS AND COMPANY et al.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicants's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority

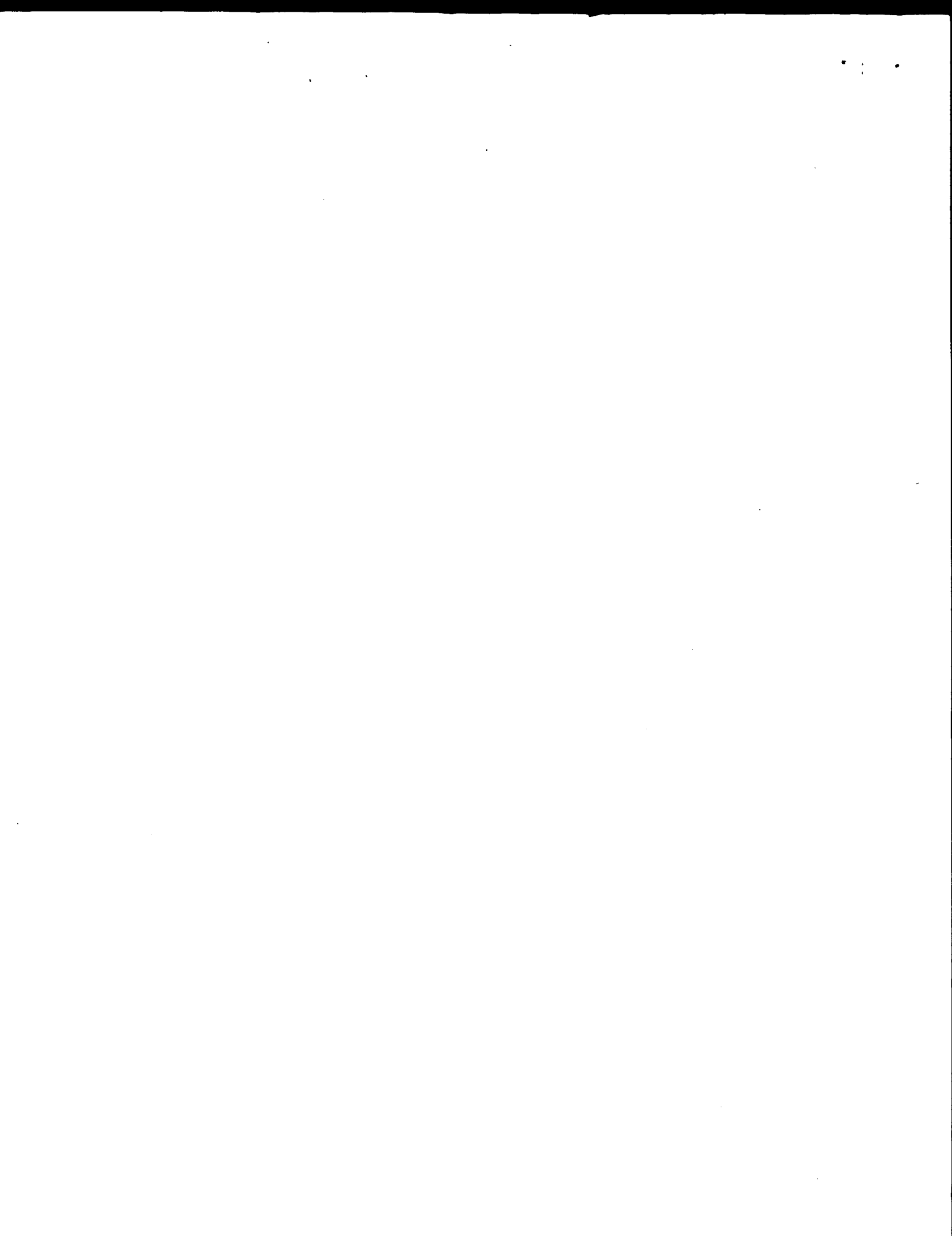
European Patent Office, P.B. 5818 Patentlaan 2  
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Authorized officer

Mireille Claudepierre

**TRB NOTED**

11.9.98



## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.



## NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### "Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

**It must be in the language in which the international application is to be published.**

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

### Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

